

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
31 March 2005 (31.03.2005)

PCT

(10) International Publication Number
WO 2005/028360 A1

(51) International Patent Classification⁷: **B82B 3/00, H01J 37/317, H01L 21/26, 21/285, 21/311, 21/3213**

Christchurch, 8004 (NZ). **PARTRIDGE**, James, Gordon [GB/NZ]; Unit 5, 477 Madras Street, St Albans, Christchurch, 8001 (NZ).

(21) International Application Number:

PCT/NZ2004/000230

(74) Agents: **ADAMS**, Matthew, D et al.; A J Park, 6th Floor Huddart Parker Building, PO Box 949, Wellington, 6015 (NZ).

(22) International Filing Date:

23 September 2004 (23.09.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

528448

24 September 2003 (24.09.2003) NZ

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (*for all designated States except US*): **NANOCLUSTER DEVICES LIMITED** [NZ/NZ]; Forestry School Building, Forestry Road, Elam, Christchurch, 8004 (NZ).

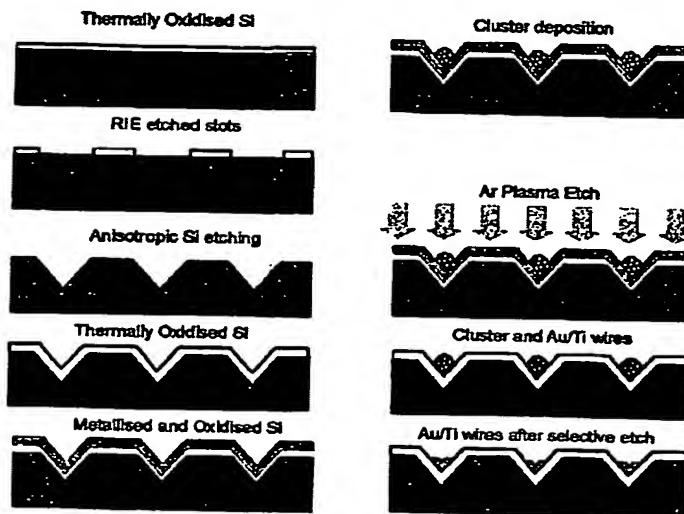
(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **BROWN**, Simon, Anthony [NZ/NZ]; 81 Hinatu Street, Riccarton,

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

[Continued on next page]

(54) Title: **ETCH MASKS BASED ON TEMPLATE-ASSEMBLED NANOCCLUSERS**



(57) **Abstract:** Nanoscale or mesoscale structures are fabricated on the surface of a substrate (e.g. silicon) by the aggregation of atomic clusters (e.g. antimony or bismuth) into V-grooves. These structures, preferably in the form of nanowires, are used as etching masks for the subsequent etching of the substrate. In an embodiment the V-grooves are metallised (e.g. with titanium or gold) prior to the deposition of the clusters. In this case the use of the nanostructures (e.g. antimony or bismuth) as an etching mask results in the formation of nanostructures of the underlying metal (e.g. titanium or gold). In this way the dimensions of the nanowires are transferred into the underlying metal film and the method allows fabrication of nanowires from materials (e.g. titanium or gold) that cannot be deposited as clusters.

BEST AVAILABLE COPY

WO 2005/028360 A1